



Epi notes

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Case-Control Study of the Salmonella Enteritidis Outbreak Associated with Toast Café, Mecklenburg County, NC 2012

The North Carolina Division of Public Health (NC DPH) was notified on April 3 of three confirmed Salmonella enteritidis (SE) infections among people dining at a local restaurant in Charlotte. NCDPH supported the Mecklenburg County Health Department and initiated a case-control study to identify the food vehicle(s) and prevent further illness. Cases were defined as sudden onset of abdominal pain, diarrhea or vomiting, with or without fever, within 72 hours after dining at the restaurant on March 25. Controls were randomly selected from credit card receipts of patrons who dined on March 25th. Mecklenburg County communicable diseases nursing staff interviewed cases-patients and controls regarding menu items consumed and hygiene practices. Pulsed-field gel electrophoresis (PFGE) testing was performed at the State Laboratory of Public Health on culture isolates. County environmental health specialists inspected the restaurant and interviewed staff. We calculated odds ratios (OR) and 95 percent confidence intervals (CIs) using Pearson's chi-square.

A total of 29 SE cases meeting case definition were identified with illness onset during March 26-28, 2012; 25 (86%) were included in this study. We enrolled and interviewed 29 controls. The median age of cases was 35 years (range: 13-67 years) and median age of controls was 34 years (range: 5-66 years). Among cases, diarrhea occurred in 25 (100%), bloody diarrhea in nine (36%) and fever in 19 (76%). Among culture isolates from 11 SE cases tested using PFGE, all matched the common North Carolina pattern B. Case-patients and controls ate between 9:15 a.m.–12:30 p.m. on March 25th and the median dining time was 11 a.m. Any egg consumption (OR= 20, 95% CI= 2 - 170), 'runny' eggs (OR= 35, 95%

CI= 7 - 176), and hollandaise sauce (OR= 115, 95% CI= 12 - 1115) were strongly associated with illness. The environmental health inspection identified that eggs were unpasteurized and hollandaise sauce was not properly prepared and stored according to food safety recommendations. Subsequently, the restaurant has begun using only pasteurized eggs and has changed their Hollandaise sauce recipe to ensure appropriate temperature controls.

On March 25, breakfast and brunch service at this popular restaurant resulted in a SE outbreak among patrons; improperly prepared eggs were the vehicle for infection. This outbreak illustrates the importance of using pasteurized eggs and/or following food preparation standards for egg dishes in which undercooked/raw eggs or hollandaise sauce are consumed.

Submitted by:

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CONTENTS

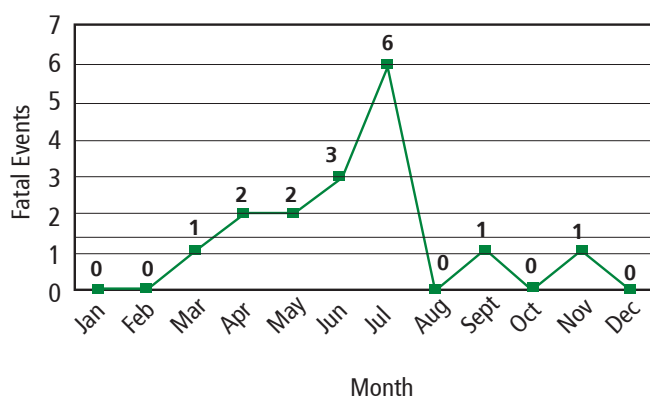
Hyperthermia Deaths of Children in Vehicles.....	Page 2
Detergent Scare Leads to Collaborative Investigation.....	Page 4
Raleigh NWS Messaging Reflects Heat-Related ED Surveillance.....	Page 5

Hyperthermia Deaths of Children in Vehicles in North Carolina: 1999 – 2011

Exposure to heat can cause an overheating in the body (hyperthermia) that when left untreated can rapidly progress to illness, heat stroke and death. While heat-related illnesses are most often associated with outdoor activities and extreme outside temperatures, the confined space of a motor vehicle can be particularly dangerous for children as excessive heat can cause organ failure and fatal injury in a short time.

The San Francisco State University Department of Geosciences has been tracking these deaths since 1998 and reports that 530 children (approximately 38 per year) have died from hyperthermia in vehicles nationwide¹. North Carolina accounted for 19 of these deaths from 16* separate events during 1999 to 2011 (Figure 1). Over this 13-year period, Wake County had two fatal events while Alamance, Carteret, Cumberland, Dare, Davidson, Guilford, Hoke, Iredell, Jackson, Nash, Richmond, Rutherford, Scotland and Watauga counties each had one.

Figure 2. Hyperthermia Deaths of Children in Vehicles in North Carolina by Month, 1999 – 2011.



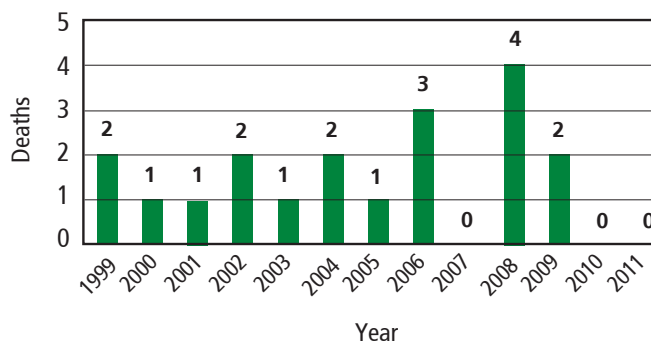
Time of Year

No deaths have been reported in North Carolina since 2009. However, the danger for injury and death from hyperthermia in vehicles still remains. This year, the first nationally reported deaths occurred in May¹. Historically, in North Carolina and nationwide, most deaths occur in the summer months (Figure 2).

Temperature

A 2005 study of vehicle temperatures found that when the ambient temperature is between 72 degrees and 96 degrees Fahrenheit outside of the vehicle

Figure 1. Hyperthermia Deaths of Children in Vehicles in North Carolina, 1999 to 2011.



the temperature can increase inside the vehicle by approximately 40 degrees within one hour, with 80 percent of that increase occurring within the first 30 minutes². For example, on a sunny 72 degree day, an idle vehicle's internal temperature can reach 117 degrees Fahrenheit within one hour. We obtained local temperatures for the day of each of the 19 North Carolina fatalities³. The mean temperatures ranged from 62 degrees to 84 degrees Fahrenheit. The highest maximum temperature was 95 degrees. Temperatures inside the vehicles could easily have surpassed 100 degrees Fahrenheit.

Circumstances

There are three general circumstances in which children die from hyperthermia in vehicles: 1) the child accesses the vehicle on his or her own; 2) the caregiver forgets that the child is in the vehicle (often with a change of routine) and does not remove them upon exiting the vehicle; or, 3) the child is intentionally left unattended while the caregiver goes to perform a task or run an errand (Figure 3).

Table 1. Local temperature averages on the day of each vehicle fatality, 1999 – 2011.

Temperature	Ranges	Average
Minimum	46 – 73 F	64.8 F
Mean	62 – 84 F	75.4 F
Maximum	73 - 95 F	86.8 F

cont. on page 3

Figure 3. Hyperthermia Deaths of Children in Vehicles in North Carolina by Age and Circumstance, 1999 – 2011.



Accessed: Nine children died in six separate events when the children accessed a vehicle unnoticed. The range of time spent in the vehicle was approximately 30 minutes to six hours after they were discovered missing.

Forgotten: Five children, including three infants, died in five separate events when they were forgotten in a vehicle by a caregiver. These children were found between one and eight hours later either by a passerby or the caregiver.

Unattended: Five children died in five separate events when they were intentionally left in a vehicle while the caregiver performed an errand. These children were discovered unresponsive or deceased after being left

unattended in a vehicle for less than one hour (two deaths), for one to three hours (two deaths) and one child remained in the vehicle for over 10 hours. Three of these deaths were ruled accidental by the Office of the Chief Medical Examiner, one was determined to be homicide, and one did not lead to an identifiable manner of death.

Children who accessed a vehicle on their own did so at their own home (five deaths) or at a relative's home (one death). Children intentionally left unattended were left in a vehicle at home, a relative's home, a caregiver's work place and a church. Children who were forgotten were in a vehicle at the caregiver's work (four deaths) or at a relative's home.

Prevention

Injury and death from hyperthermia in vehicles is preventable. While most of these deaths occur in the summer, it is necessary to be aware of the dangers of hyperthermia year round. Safe Kids North Carolina offers the following prevention tips:

- **Never leave a child alone in a vehicle.**
Check to make sure all children exit the vehicle when you reach your destination.
- **Lock the doors when your vehicle is parked. Teach children that cars are not places to play.**
- **Busy parents have a lot on their minds, so give yourself a reminder. Place your purse, briefcase or other important items in the backseat next to your child's car seat to help you remember to look in the back before leaving the car.**
- **Set a reminder on your cell phone or other mobile device to remind you to drop off children at school or daycare when routines change.**
- **Make an agreement with your child's school or daycare that you will be notified if your child is not dropped off at the normal time.**
- **If you see a child or pet left unattended in a vehicle, call 911 immediately.**
- **Check vehicles and trunks first if a child goes missing.**

References:

1. <http://ggweather.com/heat/>
2. McLaren, C., Null, J., Y Quinn, J. (2005). Heat stress from enclosed vehicles: Moderate ambient temperatures cause significant temperature rise in enclosed vehicles. *Pediatrics*, 116 (1), e109 – e112.
3. Weather Underground: www.wunderground.com
4. Safe Kids NC: www.ncsafekids.org

*In 2006 all three deaths occurred in one incident. In 2008 four deaths resulted from three incidents including the death of a child who was visiting North Carolina.

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Detergent Scare Leads to Collaborative Investigation

In May 2012, two children were treated at North Carolina hospitals after ingestion of concentrated liquid laundry detergent from single use detergent packs; the Carolinas Poison Center (CPC) was contacted for clinical consultation of these cases. The detergent packs are new products, introduced to market in February 2012. Since their introduction, the American Association of Poison Control Centers has received more than 300 case reports of acute illness following ingestion. Symptoms of the North Carolina case-patients included vomiting, and lethargy. Both patients required mechanical ventilation but recovered. The CPC contacted the Occupational and Environmental Epidemiology Branch, who then contacted the State Laboratory's Chemical Terrorism and Threat (CTAT) laboratory to test the detergent packs for chemicals not listed on the Material Safety Data Sheet (MSDS). The CTAT and CPC had also collaborated in 2007 for the detection of 1,4-Butanediol in Aqua Dots toy beads. Since symptoms were similar in these cases, the CTAT agreed to perform the same testing. Samples were received on May 14th, and testing began immediately.

Initial headspace analysis of the detergent packs demonstrated that the products did not contain 1,4-butanediol at a detectable level. Comparing the MSDS and results from the headspace analysis showed only one unexpected compound, Undecane. For comparison, CTAT was able to identify Undecane in another liquid detergent that is commonly used in the laboratory. Further analysis were performed, however, detergents are difficult to work with in the laboratory. They are both miscible (i.e., easily forms a homogenous solution) and viscous (i.e., thickness). Initial attempts to mix the

detergent with various organic solvents yielded either poor separations or no separations. Mixing the detergent with water in a 2.5:1 ratio produced an unexpectedly thick dilution. This physical property could possibly have been a contributing factor in the children aspirating the detergent and requiring intubation.

A dried extract of the detergent was then concentrated and analyzed by Gas Chromatography/Mass Spectrometry. While no 1,4-Butanediol was detected, the compound 2-Methyl-1,3-propanediol was detected. 2-Methyl-1,3-propanediol is commonly used as a solvent glycol in personal care products. The CTAT laboratory suspended testing because the matter was referred to The Consumer Product Safety Commission. Currently, the manufacturers of several brands of single use detergent packs are exploring how to best safeguard these detergent packs to protect children from easily ingesting them. While the CTAT lab was unable to detect any unusual compounds, the response continues to highlight the importance of collaboration between CPC and the NCDPH.

Submitted by: William "Tex" Parks, Chemistry Supervisor III and Bernard Barrameda, Chemist II Chemical Terrorism and Threat Unit, NC SLPH

Epidemiology Section Employee Recognition

David Lipton:

David is one of those rare individuals who answered the call to duty and service when many others were reluctant to do so. This takes courage, dedication and self-sacrifice. During the past year, the Health Hazards Control unit lost all of its leaders to retirement, illness or resignation. A large leadership and supervisory vacuum was created by this loss. David volunteered to help fill this void.

During this time, David has prepared and submitted all of the administrative, budgetary and unit-related requirements on time and with a high degree of accuracy. Moreover, he continued to provide exceptional industrial hygiene consultative services with indoor air quality issues, most notably mold. David has held unit meetings to keep staff up to date with the many changes in policy and procedures, prepared reports, monitored employee attendance, tracked timesheets, and coached and counseled personnel whenever a problem arose. He was able to keep the unit focused and functional with a minimal degree of disruption. David has had



Pictured from L-R, Dr. Mina Shehee, Recipient David Lipton and Dr. Megan Davies

no formal supervisory experience or training prior to this time. This was a remarkable feat! As an acting manager myself, I could not have fulfilled my duties and responsibilities without him. I am truly grateful for David's professionalism and service.

Through David's dedication and perseverance, he was able to keep the unit functional and productive. Without his service and leadership, the unit mission would have been severely impacted and would have resulted in a disruption of services to our customers.

Personnel Changes in NC - State Laboratory Director Resigns

Dr. Leslie Wolf, State Laboratory Director, resigned from the N.C. State Laboratory of Public Health effective June 30. Dr. Wolf's husband took a new teaching position in Kentucky and their family has relocated to the Bluegrass State. Dr. Wolf will be sorely missed by her laboratory family and other public health colleagues. We wish her well in her new home. Additionally, Dr. David Keller, Assistant Laboratory Director, also left the SLPH effective May 31 to pursue another career opportunity. The new State Laboratory Director has been selected and will assume the helm Jan. 3. The process to hire a new Assistant Laboratory Director is underway.

In order to provide for continuity of operations, leadership and to meet current laboratory certification requirements until the new State Laboratory Director reports for duty, Dr. Lou Turner will become the interim State Laboratory Director effective July 1.

There will be a new home for the State Laboratory and the Office of the Chief Medical Examiner beginning in November 2012. As we approach the move date, we will send updates to our partners.

Victoria Mobley, MD, MPH appointed Public Health Physician with the Communicable Disease Branch



Victoria Mobley, MD

We are delighted to announce the appointment of Dr. Victoria Mobley in a Public Health Physician II position with the Communicable Disease Branch on June 1. Vicki is board certified in both Internal Medicine and Infectious Diseases. Vicki received her medical degree from Duke University School of Medicine and then went on to complete her Internal Medicine residency at Johns Hopkins Hospital in Baltimore, MD. She obtained her Master's degree in epidemiology from the Gillings School of Global Public Health at UNC in Chapel Hill, where she also completed her Infectious Diseases training. Most recently, Vicki was a post-doctoral research fellow and Clinical Instructor in the UNC School of Medicine. Her rich professional background includes experience in a local health department (HIV care at Robeson County HIV clinic); award winning work on a health promotion program for women in state correctional institutions; work with the North Carolina rural health clinic network; and international infectious

disease experience. We are indeed fortunate to have her on staff with us, and have immediately tapped on her expertise on her second to assist in the investigation of a respiratory disease outbreak in Guilford County! Dr. Mobley will ensure resident clinical expertise in HIV/AIDS and STD related activities carried out by state- and regionally-based staff of the HIV/STD unit of the Communicable Disease Branch and will work with the rest of the Communicable Disease Branch in response to outbreaks as illustrated here. She will also eventually supervise field staff of the branch, and will head viral hepatitis surveillance and control activities carried out by the Medical Consultation Unit.

Submitted by:

Evelyn Foust, CPM, MPH, Head, Communicable Disease Branch and Jean-Marie Maillard, MD, MSc, Head, Medical Consultation Unit.

Raleigh NWS Messaging Reflects Heat-Related ED Surveillance

Last year there were more than 1,200 emergency department (ED) visits for a heat-related illness (HRI) in North Carolina between May and September. Many of these ED visits happened with temperatures below levels at which the Raleigh National Weather Service (NWS) issues messages that warn the public about heat. NC DPH routinely monitors ED visits for HRI using NC DETECT. In 2011, the first significant spike in HRI ED visits occurred during May 29 to June 6 when 130 people were seen. This spike occurred at temperatures in the low 90s.

Traditionally the National Weather Service (NWS) issues heat advisories and warnings when the heat index reaches 112 and 114, respectively. However, the HRI surveillance during the past five years has shown that large numbers of HRI occur at temperatures well below the advisory and warning thresholds, especially in May and June when people aren't yet acclimated to warm temperatures.

Recently, the Climate Ready NC Program, within the Epidemiology Section, shared five years of surveillance data on HRI, which was prepared through a partnership between the Epidemiology Section and the Injury

Prevention and Violence Control Branch. The Raleigh NWS responded last Friday by issuing heat messages via their Hazardous Weather Outlook, for temperatures in the 90s.

This fruitful collaboration aimed at reducing HRI is a national success. While NWS offices have always been able to alter their communications to reflect local conditions, often health officials have not worked closely with the NWS. Thus far only New York City and Oregon have successfully altered NWS communications on heat. In the future, the Climate Ready NC Program hopes to work with NWS to create heat-related messaging that reflects what we know about the temperatures at which people become ill. Currently, the Southeast Regional Climate Center is examining the relationship between heat index and ED visits to establish the temperatures at which messaging may be most effective.

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Prepared 6/23/2012

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